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AUTHOR Pace, Ann J.; And Others
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ABSTRACT

An earlier study found virtually no relationship between college students' reported studying practices and various tests of reading comprehension, so a second study investigated whether different results would be obtained with an instrument based on study strategies college students actually reported using. Scores on this instrument were to be correlated with course grades and test scores. Directions asked 76 college students in an earth science course and 73 secondary students in a physics course to report what they do when they study an assigned book chapter. Via a 5-point Likert Scale, the students indicated the frequency of their use of 18 strategies, which were organized into 4 sections. The four sections of the instrument dealt with: (1) previewing the chapter; (2) the initial reading; (3) failures in comprehension; and (4) chapter review. Items regarding previewing strategies were weighted at three levels according to the degree of information a student could obtain from using a procedure, while strategies in the other sections were weighted at three levels according to the extent of active processing involved. Results were similar for both groups, although the college students had significantly higher quantitative and qualitative scores than the high school students. The students' measures of their study practices were then compared to their course grades and test scores. The results reiterate those of the previous study and raise further questions about the supposed relationship between reported study strategies and academic performance. The questionnaire items are appended. (NKA)

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The Relationship between Students' Self-reports of Text Studying Practices and Course
Achievement

Ann J. Pace, University of Missouri-Kansas City; Arlie R. Peck, Lincoln Memorial
University; and John K. Sherk, Jr., University of Missouri - Kansas City

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ABSTRACT

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Ann J. Pace, University of Missouri-Kansas City; Arlie R. Peck, Lincoln Memorial University;
and John K. Sherk, Jr., University of Missouri-Kansas City

A previous study by these investigators found virtually no relationship between college students' reported studying practices and various tests of reading comprehension. One purpose of this study was to see whether different results would be obtained with an instrument based on strategies college students actually reported using. Also, scores on this instrument were to be correlated with course grades and test scores.

Directions ask students to report what they do when they study an assigned textbook chapter. Four sections of the instrument deal, respectively, with previewing the chapter, its initial reading, failures in comprehension, and chapter review. Previewing strategies are ranked at three levels according to the degree of information a student could obtain from using a procedure. Strategies in the other sections are ranked at three levels according to the extent of active processing involved. Students respond to each item on a 5-point Likert scale, reflecting reported degree of use. Two kinds of scores are obtained. A quantitative score is simply the sum of the Likert-scale choices. A weighted or qualitative score reflects the strategy level assigned to each item.

This questionnaire was given to a group of 76 college students in an Earth Sciences course, and to 73 secondary students enrolled in mixed-grade sections of a high school physical sciences course. Scores of the college students were related to their final test score in the course, the final grade, and cumulative GPA. High school students' scores were related to a final test score and a final quarter score.

Although college students had significantly higher quantitative and qualitative scores than the high school students, the pattern of results was similar for both groups. A principal components factor analysis was performed on each set of scores, producing two distinct factors in each case. For both groups, the two study strategy scores loaded highly on one factor, and the measures of academic outcome on the other. These results raise further questions about the supposed relationship between reported study strategies and academic performance.

THE RELATIONSHIP BETWEEN STUDENTS' SELF-REPORTS OF TEXT STUDYING PRACTICES AND COURSE ACHIEVEMENT

Ann J. Pace, University of Missouri - Kansas City; Arlie R. Peck, Lincoln Memorial University;
and John K. Sherk, Jr., University of Missouri - Kansas City

In a previous study by these authors (Pace, Sherk, Peck, & Baldwin, 1985), virtually no relationship was found between a measure of students' studying practices and scores obtained on multiple-choice tests on passages they had read. Factor analyses of the studying scale, multiple-choice test scores, and the reading comprehension portion of the Nelson-Denny Reading Test, produced two distinct factors, one representing the test scores and the other, the studying measure. (In two instances, the Nelson-Denny had high loadings on the reading test factor and moderate loadings on the study factor.) The present investigation was undertaken to see whether different results would be obtained with use of a more carefully developed self-report measure of studying that would then be related to achievement in actual courses.

One expectation of this effort was that an instrument based on strategies students actually reported using, and employed with reference to studying in a particular course, would stand a greater probability of showing a relationship to academic outcomes, especially if this achievement was specific to that course. However, the existing literature is equivocal as to whether this is a realistic expectation. A number of self-report measures have been developed during the past several years, for both commercial and experimental purposes. Recent reviews of such instruments, however (Rohwer, 1984; Schulte & Weinstein, 1981; Weinstein & Underwood, 1985), indicate that the relationship of scores on many of them to academic outcomes is not well supported.

A picture of this relationship is obscured by the variability among the different self-report measures in use. Until quite recently, most of them have focused primarily on traditional study skills, such as organizing time and place of study, work habits, and attitudes toward studying (Schulte & Weinstein, 1981). In the past few years, though, there has been a growing emphasis on the importance of cognitive components of studying, or those active processes a learner might use to help achieve desired outcomes (Biggs, 1984; Densereau, 1985; Thomas & Rohwer, 1986; Weinstein & Underwood, 1985). Some of the newer self-report measures include this cognitive focus. Given both problems with the design and validation of many of these instruments (Rohwer, 1984; Weinstein & Underwood, 1985), as well as this diversity of content, a summary statement regarding the relationship between studying practices, as assessed through self reports, and academic outcomes is apparently premature.

Further, according to Weinstein and Underwood (1985), there has been no empirical validation of "good study skills" and no instrument has yet been validated for diagnostic use. Therefore, no concrete evidence suggests that particular score profiles will effect specific academic outcomes, even though strong research and theoretical support exists for the cognitive base of more recent inventories. Additionally, Rohwer (1984) proposes that a composite profile of studying activities may reveal little about differences in academic achievement. Instead, equivalent academic outcomes may be achieved through varying combinations of studying practices and background factors, such as motivation, aptitudes, and interests, a view supported by Biggs (1984).

Despite this pessimistic history, promising results are being obtained with instruments that address the many difficulties involved, such as the Learning and Study Strategies Inventory (LASSI) developed by Weinstein and her colleagues (Weinstein & Underwood, 1985). Among the factors that should be considered in devising a self-report measure of studying is the variability across courses in situation-specific contextual factors, such as instructor expectations, criterial tasks, familiarity of content, and so forth (Schulte & Weinstein, 1981; Thomas & Rohwer, 1986). One way to try to control for this diversity is to target the instrument to a particular course. Instead of asking students for typical study practices, such an instrument would request that students respond according to how they have studied in a specified course. This practice would then permit assessment of the relationship between these self reports and outcomes specific to that course. Also, once students had acquired some experience with a particular course, most of them would have gained insight into what they needed to do to meet the requirements of the course. The instrument used in this investigation, therefore, was designed for this purpose: to try to fit the realistic studying situations faced by students at the secondary and college levels. Further, it focused specifically on how students studied the textbook in the course, as distinct from lecture notes or other instructional aids.

Method

Materials

In order to develop a self-report measure directed at how students actually studied a required textbook for a course, college students enrolled in a reading and study skills course were first presented with a series of open-ended questions which asked them what they did while studying a text for a particular course. One question asked them what they did before beginning to read an assigned chapter, another concerned their activities while reading a chapter for the first time, a third dealt with what they did when they came across portions of the text they

did not understand, while a fourth question asked about anything they did after reading the chapter for the first time. Thus the focus was on the initial learning of assigned material, rather than review at a later time. The responses of the students were then categorized into distinct activities, as determined by agreement of the three investigators. From these lists, six items were derived for the first question (prereading activities), six items for the second question (initial reading), three items for the third question (comprehension problems), and three items for the fourth question (initial chapter review). These 18 items were then organized into the self-report instrument, with four sections corresponding to the four original questions. (The items included in the questionnaire are shown in Appendix A.) All strategies listed are those which students actually mentioned. Directions ask students to report what they do when they study an assigned textbook chapter. Students are to respond to each item on a 5-point Likert scale, reflecting reported degree of use, from "Never" to "Always."

Each item was then ranked, independently, by the investigators on a scale of from one (lowest) to three (highest), on the basis of its presumed effectiveness as a study procedure. Differences were resolved through consultation. Previewing strategies were ranked according to the degree of conceptual information a student could obtain from using a procedure. Other strategies (sections B, C, and D; see Appendix A) are ranked according to the degree of active processing involved in using the strategy. At the first level are practices termed "attentional," which serve primarily to focus a student's attention on some portion of the text (see Reynolds, Shirey, Wade, Trathen, & Shepard, 1986). At the second level are "organizational" strategies which help the student categorize, organize, or reorder material in the text. Third-level strategies, presumably those which are most effective, are termed "constructive," in that they should help a student become actively engaged in thinking about the text and monitor his or her understanding of it. These rankings did not appear on the questionnaires distributed to the students, but were used as weights in one method of scoring student responses.

Procedure

Since the questionnaire inquired of students' practices while studying an assigned text, its most appropriate use would be in a course that was highly text-dependent, that is, one in which the instructor required students to know a good deal of the material in the textbook, whether or not it was covered in lecture. It should also be a fairly large course and one that did not demand much prior knowledge of the subject. At the college level, an introductory earth sciences course was selected for this purpose. The study was explained to the course instructor, and he agreed

to have the questionnaire administered during one class period and to provide course grades. A person familiar with the instructor, the course, and the investigation visited the class during the last month of the semester and asked students if they would complete the questionnaire. They were to sign their names if they gave permission to have their grade-point averages (GPAs), course grades, and final grades provided to the investigators. Usable information was obtained from 73 students.

To compare the performance of college-aged students with younger students, agreement was obtained from the principal and a science teacher at a local high school to have the questionnaire given to students in an introductory physical science course, on a voluntary basis. Permission was secured from participating students to let the investigators have access to their course grades and final test scores. Usably complete sets of scores were obtained from 76 students in three mixed-grade sections of the course, all taught by the same teacher. Of this number, 49 were in the 9th grade, 22 in the 10th grade, and 5 in the 11th.

Analyses

Responses to the study questionnaire were scored in two ways. In both cases, the 5-point Likert scale was scored similarly, from 0 for a "Never" reply, to 4 for "Always." A "quantitative" score represented the sum of the scaled responses across all items. To obtain a "qualitative" score, each item score was multiplied by the rank (1, 2, or 3) assigned to that item. (For example, a student who circled "Always" on a level 3 item, would be given a 12 for that item. Likewise, a student who indicated "Sometimes" on a level 2 item, would get a 4, while someone who chose "Never" on a level 1 item, would be scored 0.) These weighted scores were then summed across all 18 items. It was thought that the greater range of scores produced by this weighting would be better able to differentiate higher achieving from lower achieving students. Items within categories were not analyzed separately because of the limited number of such items, particularly in categories C and D.

For the college students, the quantitative and qualitative study scores were related to their final test scores in the course, final grades, and cumulative GPAs. These scores were all entered into a factor analysis, with varimax rotation. A separate factor analysis with varimax rotation was performed for the scores of the high school students. Included were their quantitative scores, their qualitative scores, final test scores, and final quarter scores. (No GPAs were available for the high school students.)

In addition, two one-way analyses of variance were performed, with grade level as the independent variable in both cases. In one analysis, the dependent variable was the quantitative score, in the other, it was the qualitative score. These were the only measures that were comparable across the two groups of students.

Results

The results of the factor analyses were similar for both the high school and college students. In each case, the rotated factor matrix produced two distinct factors: one representing the various measures of course achievement, the other the two (correlated) questionnaire scores. The two factor matrices are shown in Table 1. For the college

Insert Table 1 about here

students, final test score, final grade, and GPA loaded highly on one factor; the loadings for both the quantitative and qualitative scores were near zero. On the second factor, both of these scores had loadings of .99, while the loading of none of the other scores reached .20, either positive or negative. The pattern for the high school data is similar. The final test scores and the final quarter score loaded highly on one factor, while the two study skill scores each had loadings of .99 on the other factor.

The two analyses of variance produced similar results. The main effect of grade for the analysis using quantitative scores was significant, $F = 5.4$, $p < .005$. A similar significant main effect was obtained with the analysis using qualitative scores, $F = 4.7$, $p < .005$. In both cases, post hoc Newman-Keuls tests (Kirk, 1968), showed that these effects were produced by significant mean differences between ninth-grade and college scores.

Discussion

The results of this investigation replicate those obtained in the previous study by these authors (Pace, Sherk, Peck, & Baldwin, 1985), and even more dramatically. Self-report measures of students' studying practices and indicators of academic achievement clearly appear to be unrelated, at least on the basis of the factor analytic procedures used. The question remains: Why?

One possible explanation certainly involves the instrument used to make this assessment. Self-report measures are often suspect to some degree, and yet at least one study (Weigel & Weigel, 1967) has provided some evidence that college students can distinguish between their knowledge of good study behaviors and their own use of them. A recent study by Brennan, Winograd, Bridge, and Hiebert (1986), however, suggests that college students'

perceptions of their own studying practices may not be highly accurate. Students in an experimental session consistently reported higher use of specific strategies than observers noted them using. Thus, inflated scores could contaminate efforts to reliably relate reported study behaviors to academic outcomes. Also, the psychometric properties of the questionnaire employed in the present study, particularly reliability, need to be studied further. However, the obtained results are so decisive that the chances seem good that they represent a real phenomenon rather than a methodological artifact. If this is so, then what does this finding mean?

The case may be that academic outcomes in naturalistic settings are influenced by many factors other than studying practices, particularly those limited to study of assigned reading. A rather strong argument for this possibility has recently been presented by Schuman, Walsh, Olson, and Etheridge (1985). In reporting on a series of large-scale investigations of the relationship between studying and college grades, conducted over a number of years, these authors conclude (p. 958) that, "... it is class attendance much more than hours studied that helps explain variation in grade-point averages." Students in a large university who attended class more often tended to get higher grades. Apparently whatever occurred during class time, including lecture, was rather accurately perceived by these students as having more direct bearing on course outcomes than the amount of time spent studying. Measures of aptitude, including SAT scores, were also shown to have a much stronger relationship to GPA than studying. Various measures were used by the authors to confirm students' self-reports of studying, and similar results were obtained.

Recent analyses of academic studying, such as those by Biggs (1984) and Thomas and Rohwer (1986) support the view that a number of personal and situational factors, such as motivation and course expectations, influence academic outcomes, and in complex ways. A single model of "good" studying practice may, indeed, be inappropriate. Certainly, educators and researchers need to know much more about the contextual or situational factors that affect students' perceptions of what is expected of them, academically, in classrooms.

There are, nonetheless, some studies which show a relationship between academic achievement and self-reports of studying activities, such as that reported by Nist, Simpson, and Hogebe (1985). However, theirs seems to be a special case. The students in this study did not represent a cross-section of those in school, but rather they were among those students needing academic assistance who voluntarily enrolled in a course which would provide it. In this course, they had recently received intense instruction in the "correct" use of various study strategies.

Therefore, it is not surprising that the authors in this instance found a positive relationship between reported use of recommended study practices and achievement test scores given in the immediate situation. More typically, however, this may not occur.

Caution is thus advisable in the use of self-report measures of study skills, particularly for diagnostic purposes (Weinstein & Underwood, 1985). Further, assumptions about the desirability of certain studying practices, even when made on seemingly sound theoretical and research bases, need to be examined carefully. In general, greater knowledge and understanding need to be acquired concerning the complex influences on academic achievement in real settings.

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Table 1

Factor Matrices, Following Varimax Rotation, of Analyses Using
Measures of Course Achievement and Study-skill Scores

Analysis	<u>n</u>	Factor 1	Factor 2
<u>College students</u>	73		
Variables			
Final test score		.90	.20
Final course grade		.93	.02
GPA		.86	-.20
Quantitative score		-.03	.99
Qualitative score		.04	.99
<u>High school students</u>	76		
Variables			
Final quarter grade		.84	.19
Final test score		.87	-.07
Quantitative score		.06	.99
Qualitative score		.06	.99

APPENDIX A

ITEMS ON SELF-REPORT OF STUDYING QUESTIONNAIRE

NOTE: The number in parentheses after each item indicates the conceptual ranking assigned to that item. This number did not appear on the copies of the questionnaire distributed to students.

A. Before beginning to read an assigned chapter, I:

1. Read the chapter introduction and summary (if any). (2)
2. Look through the chapter to see how the information in it relates to other chapters in the book and to class material. (3)
3. Read the title and quickly glance through the chapter. (1)
4. Scan the chapter to see how long it is. (1)
5. Preview the chapter to note visual sources of information, such as pictures, graphs, maps, diagrams, charts, etc. (3)
6. Skim the chapter, making note of topic headings and subheadings. (2)

B. As I am reading an assigned chapter for the first time, I:

1. Try to memorize those parts of the chapter that I probably will have to know. (1)
2. Pause after each paragraph or section to think about what I have just read and to see how it relates to what I already know. (3)
3. Read the text slowly and carefully. (1)
4. Outline or take notes on the information I am reading and/or make notes in the margins of the book pages. (2)
5. Ask myself questions as I go along to see if I am understanding what I am reading. (3)
6. Underline or highlight what I think are important facts, concepts, or definitions. (2)

C. When I am reading a chapter and I come across a section that I do not understand, I:

1. First, reread it one time or more. If that doesn't help, I may try to rephrase it or may make a note about it so I can ask the instructor. (2)
2. Reread it slowly one time or more, concentrating on each word, phrase, or sentence. (1)
3. First, reread it carefully. Then, if that doesn't help, I review previous material in the chapter and/or read ahead to see if additional information can provide clarification. (3)

D. When I have finished reading the chapter for the first time, I:

1. Skim the chapter again and/or read the chapter summary. (1)
2. Try to answer any review questions at the end of the chapter or make up my own questions and answer them. (3)
3. Review any notes I may have made and/or the material I have underlined or highlighted. (2)